Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. In this listing of claims, claims 1-27 have been cancelled without prejudice and have been replaced with new claims 28-55.

Claims 1-27 (Canceled)

Claim 28. (New) An electrochemical cell assembly comprising:

a plurality of separate elements;

at least one groove network extending through the electrochemical cell assembly and including at least one filling port for the at least one groove network; and

a seal within each groove network that has been formed in place after assembly of said separate elements, wherein the seal provides a barrier between at least two of said separate elements to define a chamber for a fluid for operation of the electrochemical cell assembly.

Claim 29. (New) An electrochemical cell assembly as claimed in claim 28, wherein the groove network comprises a plurality of closed groove segments, each of which comprises at least a groove segment in one of said separate elements that faces and is closed by another of said separate elements, thereby to form said closed groove segments.

Claim 30. (New) An electrochemical cell assembly as claimed in claim 29, wherein at least some of said closed groove segments each comprise a first groove segment in one of said separate elements facing a second groove segment in another of said separate elements.

Claim 31. (New) An electrochemical cell assembly as claimed in claim 29, which comprises a plurality of individual electrochemical cells.

Claim 32. (New) An electrochemical cell assembly as claimed in claim 31, wherein each electrochemical cell comprises a plurality of separate elements, each of which includes a connection aperture, whereby the connection apertures form a connection duct of the groove network extending through each electrochemical cell, and wherein the connection ducts of individual electrochemical cells are interconnected and are connected to said at least one filling port, whereby the groove network extends through a plurality of electrochemical cells, to enable a seal for all of the electrochemical cells to be formed substantially simultaneously and wherein the seal has been formed by injection of a liquid elastomeric seal material and subsequent curing of the elastomeric seal material.

Claim 33. (New) An electrochemical cell assembly as claimed in claim 32, which comprises a plurality of proton exchange membrane electrochemical cells, each of which comprises an anode flow field plate, a cathode flow field plate, a membrane electrode assembly including a proton exchange membrane and located between the anode and cathode flow field plates, a first gas diffusion layer between the anode flow field plate and the membrane electrode assembly and a second gas diffusion layer between the membrane electrode assembly and the cathode flow field plate, wherein at least the anode and cathode flow field plates define apertures for forming, with apertures of other electrochemical cells, ducts for fuel, an oxidant and a coolant.

Claim 34. (New) An electrochemical cell assembly as claimed in claim 33, wherein each anode flow field plate and each cathode flow field plate include recesses to accommodate the first and second gas diffusion layers, and wherein portions of the anode and the cathode flow field plates of each electrochemical cell not separated by the membrane electrode assembly are separated by an insulator, whereby compression of the first and second gas diffusion layers is determined by the dimensions of said recesses.

Claim 35. (New) An electrochemical cell assembly as claimed in claim 33, wherein facing surfaces of each pair of anode and cathode flow field plates have substantially

flat opposed faces, and the gas diffusion layer and membrane extend substantially to edges of the flow field plates.

Claim 36. (New) An electrochemical cell assembly as claimed in claim 35, wherein surfaces of the anode and cathode flow field plates include grooves for the elastomeric seal material that fills the grooves and penetrates the gas diffusion layers, to form a seal with the membrane.

Claim 37. (New) An electrochemical cell assembly as claimed in claim 36, wherein each proton exchange membrane includes a peripheral flange, and the seal material is bonded to the peripheral flanges.

Claim 38. (New) An electrochemical cell assembly as claimed in claim 37, wherein each flat, opposed face of the anode and cathode flow field plates includes flow field channels for gases.

Claim 39. (New) An electrochemical cell assembly as claimed in claim 37, which comprises a membrane electrode unit intended for assembly with similar membrane electrode units into a larger electrochemical cell stack, the electrochemical cell assembly including, at either end thereof, end surfaces adapted for mating with end surfaces of similar membrane electrode units.

Claim 40. (New) An electrochemical cell assembly as claimed in claim 39, wherein at least one of said end surfaces is provided with a seal, for forming a seal with the end surface of another similar membrane electrode unit.

Claim 41. (New) An electrochemical cell assembly as claimed in claim 37, wherein each of the anode and cathode flow field plates includes, at one end thereof, a first fuel aperture, a first coolant aperture and a first oxidant aperture, and at the other end thereof, a second fuel aperture, a second coolant aperture and a second oxidant aperture; wherein each of the anode and cathode flow field plates includes a first

connection aperture at said one end and a second connection aperture at said other end for supply of material to form said seal.

Claim 42. (New) An electrochemical cell assembly as claimed in claim 41;

wherein the anode flow field plate includes on a rear face away from the membrane electrode assembly, a groove network portion including groove segments that extend around the fuel and oxidant apertures and that extend only partially around the coolant apertures, thereby to enable coolant to flow between the coolant apertures across the rear face thereof, wherein a second groove network portion is provided on the front face of the anode flow field plate and includes groove segments extending around at least the oxidant and coolant apertures, the anode flow field plate including a channel network, on the front face thereof, to distribute fuel gas over the first gas diffusion layer; and

wherein the cathode flow field plate includes a third groove network portion on the rear face thereof, away from the membrane electrode assembly, including groove segments that extend around the oxidant and fuel apertures and that extend only partially around the coolant apertures, thereby to enable coolant flow across the rear face thereof between the coolant apertures; and wherein a fourth groove network portion, on the front face of the cathode flow field plate, includes groove segments extending around at least the fuel and coolant apertures, the cathode flow field plate including a channel network, on the front face thereof, to distribute oxidant gas over the second gas diffusion layer.

Claim 43. (New) An electrochemical assembly as claimed in claim 41;

wherein the anode flow field plate includes on a rear face away from the membrane electrode assembly, a groove network portion including groove segments that extend around the fuel and oxidant apertures and that extend only partially around the coolant apertures, thereby to enable coolant to flow between the coolant apertures across the rear face thereof, wherein a second groove network portion is provided on the front face of the anode flow field plate and includes groove segments extending around at least the oxidant and coolant apertures, the anode flow field plate including a

channel network, on the front face thereof, to distribute fuel gas over the first gas diffusion layer; and,

wherein the cathode flow field plate includes a third groove network portion, on the front face of the cathode flow field plate having groove segments extending around at least the fuel and coolant apertures, the cathode flow field plate including a channel network, on the front face thereof, to distribute oxidant gas over the second gas diffusion layer.

Claim 44. (New) An electrochemical cell assembly as claimed in claim 42, wherein each of the connection apertures is positioned to intersect groove segments around the coolant and fuel apertures.

Claim 45. (New) An electrochemical cell assembly as claimed in claim 44, wherein the groove segments are dimensioned and are of a shape and size to provide substantially similar filling times, with longer groove segments being provided with larger cross sections, thereby to prevent occurrence of air pockets.

Claim 46. (New) An electrochemical cell assembly as claimed in claim 45, which includes vents extending between the groove network and at least one of the exterior of the electrochemical cell assembly and internal chambers within the electrochemical cell assembly, the vents being dimensioned to permit air to escape and being small enough to cause pressure to build up in the elastomeric material to ensure complete filling of the entire groove network.

Claim 47. (New) An electrochemical cell assembly as claimed in claim 46, wherein each element includes at least two connection apertures and a plurality of vents located substantially equal distance between the connection apertures thereof, for venting air during filling of the groove networks.

Claim 48. (New) An electrochemical cell assembly as claimed in claim 29, which includes an external sealing layer formed around the exterior of the electrochemical cell

assembly and formed from the same material as said seal within each groove network, wherein connections are provided between each groove network and the exterior of the electrochemical cell assembly and said external sealing layer and said seal within each groove network have been formed in place simultaneously.

Claim 49. (New) An electrochemical cell assembly as claimed in claim 48, wherein the electrochemical cell assembly comprises a plurality of individual electrochemical cells located between two end plates and wherein the external sealing layer encloses all the electrochemical cells and extends between the two end plates.

Claim 50. (New) An electrochemical cell assembly as claimed in claim 29, which includes at least one electrochemical cell and, on one side, a seal molded in place and adapted to abut the other side of another, similar electrochemical cell assembly to form a chamber for coolant, whereby a plurality of said electrochemical cell assemblies can be assembled together to form a large electrochemical cell unit assembly with coolant chambers being formed between adjacent electrochemical cell assemblies.

Claim 51. (New) An electrochemical cell assembly as claimed in claim 28, in which the seal comprises at least one of: an ethylene/acrylic polymer; a fluoro elastomer; and an Ethylene Propylene Terpolymer.

Claim 52. (New) An electrochemical cell assembly as claimed in claim 28, in which the seal comprises a flexible or rigid epoxy resin.

Claim 53. (New) An electrochemical cell assembly as claimed claim 28, in which the seal comprises a thermoplastic elastomer.

Claim 54. (New) An electrochemical cell assembly as claimed in claim 53, in which the thermoplastic elastomer comprises a polyester elastomer.

Claim 55. (New) A fuel cell assembly comprising:

a plurality of separate elements;

at least one groove network extending through the fuel cell assembly and including at least one filling port for the at least one groove network; and,

a seal within each groove network that has been formed in place after assembly of said separate elements, wherein the seal defines a barrier between at least two elements to define a chamber for a fluid for operation of the fuel cell assembly.